

# Streamlining the radiotherapy working environment with an in-house developed web application

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## Introduction

Our radiotherapy clinic recently completed a review of our working environment with an eye to modernising out-of-date or inefficient practises. Many issues were noted such as protocols and reference documents being spread over duplicated folders on network drives; accelerator control rooms covered in out-of-date and uncontrolled printouts of contacts and machine service information; and paper forms being heavily relied on for many tasks in the clinical workflow. Additionally, physics data analysis scripts could only be run on certain workstations with the correct environment and software setup. The physics group addressed these issues by developing an in-house web app, called **rodash**, to streamline communication between professional groups in the clinic, increase productivity, and improve staff quality of life.

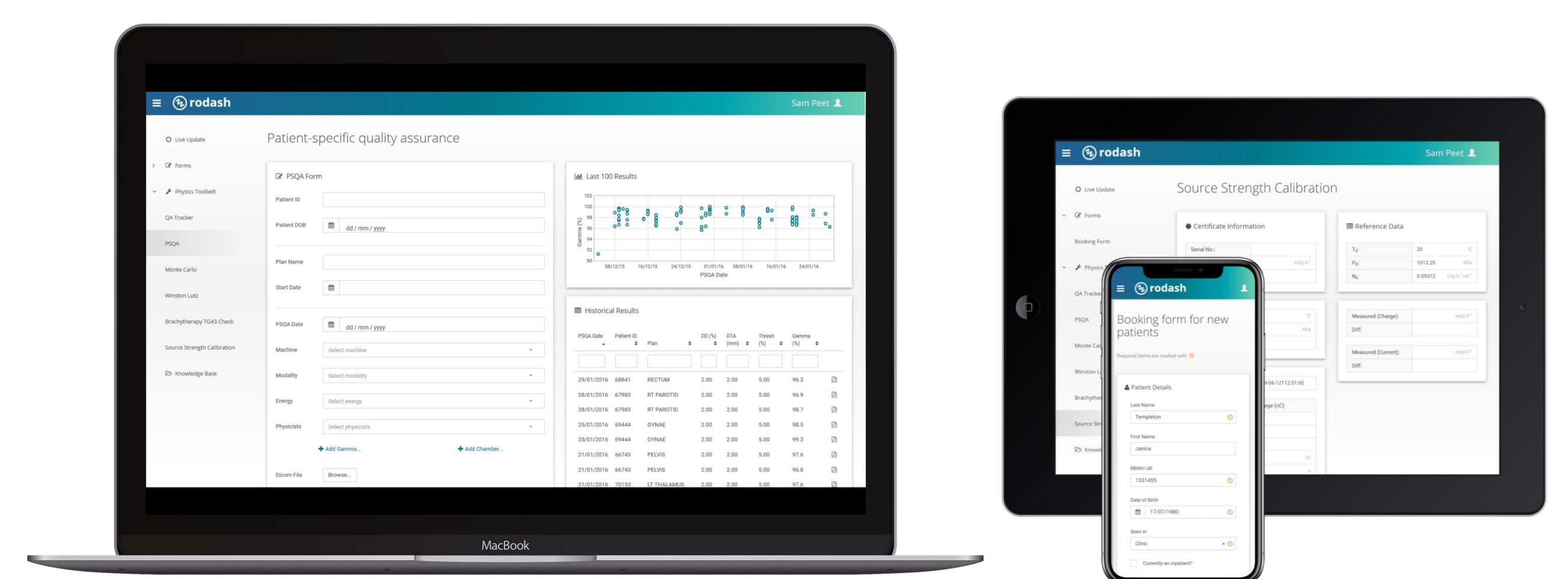
## For patients

Timing information is displayed in the waiting room, featuring approximate queue times and current linac status. This information is queried directly from the Mosaik database.



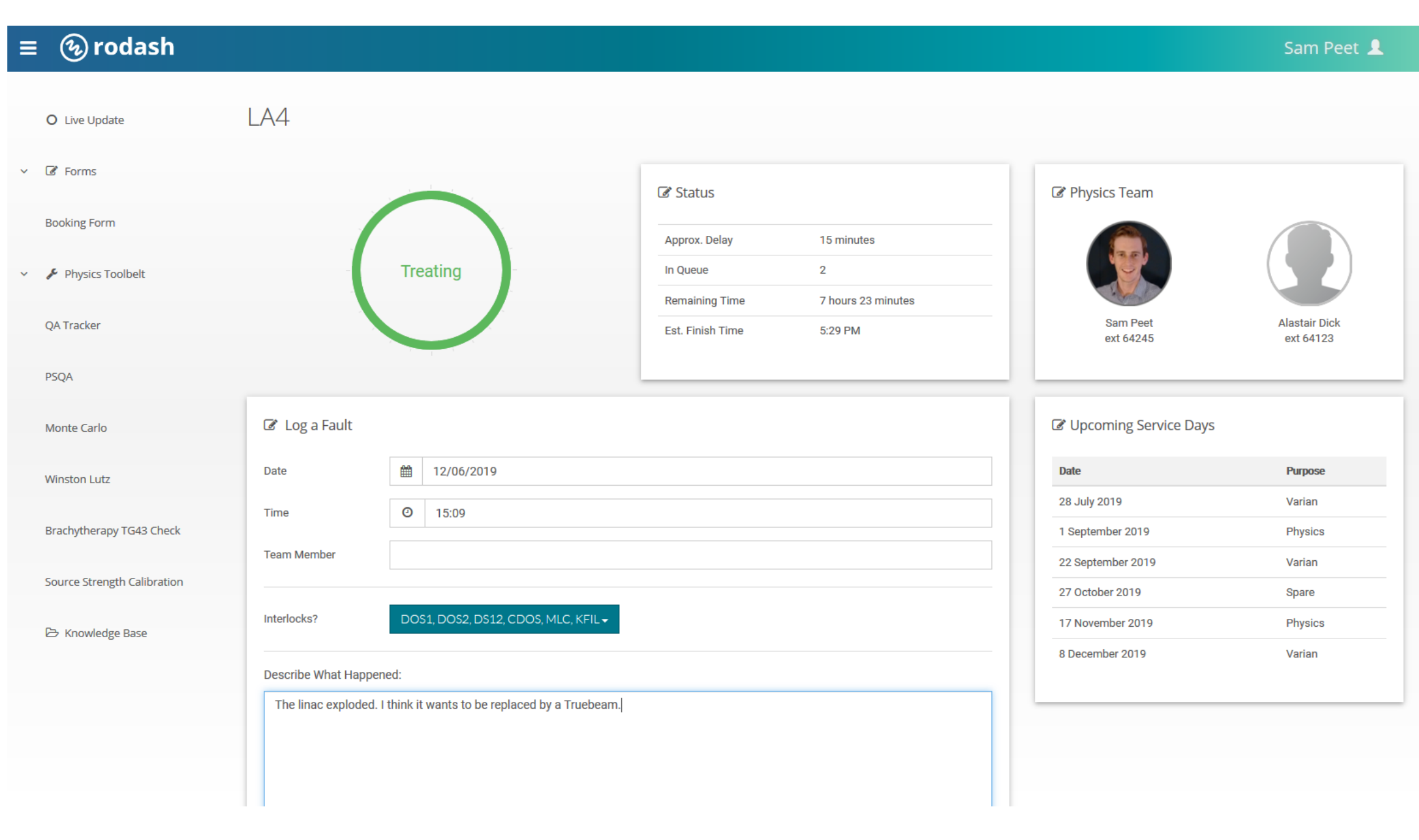
## For oncologists

The application contains a number of electronic forms and a knowledge base of protocol information. The app is fully responsive so the oncologists can get access on any device, wherever they are.



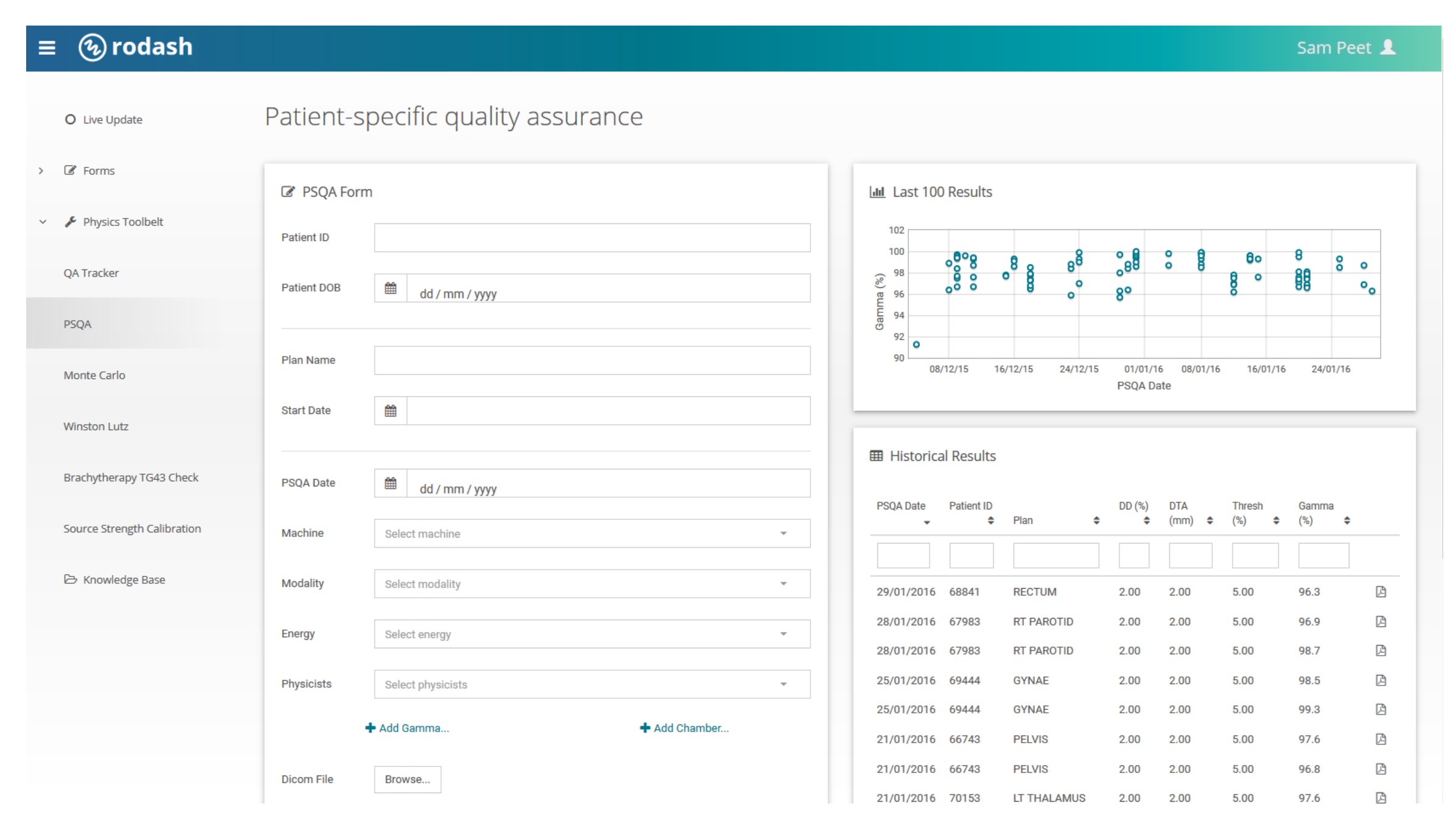
## For radiotherapists

Specific pages for each linac contain upcoming service days, contacts, finishing time estimates, and a space to log faults. The radiotherapists also maintain a knowledge base of work instructions and training materials.



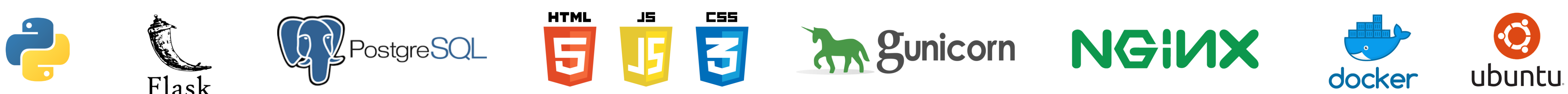
## For physicists

The app features frontends for submitting Monte Carlo jobs, performing Winston-Lutz tests, and independent TG43 brachytherapy calculations. It also manages our full PSQA workflow, including plan submission, data analysis, and trending of results.



## Technology

Developed and supported by the physics team, the app is driven by a Flask backend, an HTML5/CSS/JS (Bootstrap) frontend, and a PostgreSQL database. The app is run by a gunicorn instance and served behind an nginx reverse proxy. The full stack is deployed in docker containers on an Ubuntu 18.04 virtual server.



## Conclusion

We developed a bespoke web app to address a number of productivity issues in our clinic. This was software designed by our clinic, for our clinic, so it was shaped to fit our exact needs. The app was launched in early 2019 to a very warm reception from all stakeholders.